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- Facial cleansers.
- A composition for a facial scrub material for removal of makeup and dirt, for example, the scrub comprising particles of organopolysiloxane elastomer polymer.

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FACIAL CLEANSERS

The present invention relates to a facial cleanser, and more specifically relates to a facial cleanser which contains powdered organopolysiloxane elastomer.

The following materials have been compounded in facial cleansers for the purpose of effectively removing foundation and make-up cosmetics; plant powders such as those obtained from hydrogenated is joicha oil and hydrogenated occount oil, as well as the seeds and powders obtained from the apricot, almont, birch, walnut, peach, com, sunflower, watermelon, etc.; powders of materials of animal origin such as powdered crab shell, powdered eggshell, etc., as well as those obtained from hydrogenated learth organic powders such as those obtained from polyethylene, nylon, polypropylene, polyninyl chloride, polystyrene, and cellulose; and inorganic powders such as those obtained from abminism odde, silica, talc, and accomism oxide (Cosmetics & Tolletins, Volume 101, July, 1986).

However, with regard to facial deanewise which contain such plant-based, animal-based, or inorganic powders as listed above, the compounded powders are not spherical, but rather have acute angles and also have a high hardness, and as a consequence thereof, the facial cleaneser can damage the skin when applied. Furthermore, the powders of natural origin contain various admixed impurities, which can easily 15 cause spoilage and promote skin irritation.

On the other hand, with regard to facial cleansers which contain organic powders, although the blended cosmetic will have a smooth applications ensation when a spherical powder is used, it nevertheless evokes the sensation that a foreign-material is being applied to the skin due to the high hardness of the particles involved. Additionally, because contact with the skin is in the form of point contact, removal of dirt from the zo skin is unsatisfaction.

The object of the present invention is to solve the above problems by introducing a facial cleanser which will not irritate the skin, which is smooth in its application, and which efficiently removes organic dirt from the skin. The aforesaid object is achieved by a facial cleanser which characteristically contains an organocyle/siloxane elastomer powder.

5 To explain the preceding, the organopolysiloxane elastomer used in the present invention provides the fact cleaner of the present invention with a smooth application sensation and does not inflate the edin. Furthermore, because the particles of the powder are elastic, the removal of organic dirt from the skin is improved because contact with the skin is changed from point contact to a surface contact under the effect of the pressure of application.

20 Moreover, silicones have recently been compounded into foundation and make-up cosmetics. Silicones have much lower surface tentions than other cosmetic starting materials and thus readily adhere to be skin. Prior facial cleansers which contain non-elitione powders have an unsatisfactory silicone-removal action because these powders tack any affinity for silicones. The organopolysitionane electroner powder has affinity for the silicone starting materials compounded in cosmetics and thus can remove silicones adhering so the skin.

No specific restriction exists as to the type of curable organopolysiloxane composition which can serve as starting material for the organopolysiloxane elestomer powder. Examples in this respect are addition reaction-curing organopolysiloxane compositions which cure under plashum metal catalysis by the addition reaction-between SIH-containing dispanopolysiloxane and organopolysiloxane having silicon-boarded virgin groups; condensation-curing organopolysiloxane and organopolysiloxane and significant composition which cure in the presence of an organolir compound by a dehydrogenation reaction between hindred containing diogranopolysiloxane; condensation-curing organopysiloxane compositions which cure in the presence of an organolir compound or a sitenate ester, by a condensation reaction between an hydroxyl-terminated diogranopolysiloxane and a hydroxyl-terminated diogranopolysiloxane with the semiplified to yield-the starting, carboxyl-tiberating, carboxyl-tibera

Addition reaction-curing organopolysiloxane compositions are preferred for their rapid curing rates and excellent uniformity of curing. A particularly preferred addition reaction-curing organopolysiloxane composition is prepared from:

(A) an organopolysiloxane having at least 2 lower alkenyl groups in each molecule;

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(B) an organopolysiloxane having at least 2 silicon-bonded hydrogen atoms in each molecule; and

(C) a platinum-type catalyst.

With regard to the above, component (A) is the basic component of the silicone elastomer-generating organopolysiloxane, and curing proceeds by the addition reaction of this component with component (B) under catalysis by component (C). This component (A) must contain at least 2 silicon-bonded lower alkenyl groups in each molecule: an excellent cured product will not be obtained at fewer than two lower alkenyl groups because a network structure will not be formed. Said lower alkenyl groups are exemplified by vinyl, allyl, and propenyl. While the lower alkenyl groups can be present at any position in the molecule, their presence at the molecular terminals is preferred. The molecular structure of this component may be straight chain, branched straight chain, cyclic, or network, but a straight chain, possibly slightly branched, is preferred. The molecular weight of this component is not specifically restricted, and thus the viscosity may range from low viscosity liquids to very high viscosity gums. In order for the cured product to be obtained in the form of the rubbery elastomer, it is preferred that the viscosity at 25 degrees Centigrade be at least 100 centistokes. These organopolysiloxanes are exemplified by methylvinylsiloxanes, methylvinylsiloxanedimethylsiloxane copolymers, dimethylvinylsiloxy-terminated dimethylpolysiloxanes, dimethylvinylsiloxy-terminated dimethylsiloxane-methylphenylsiloxane copolymers, dimethylvinylsiloxydimethylsiloxane-diphenylsiloxane-methylvinylsiloxane copolymers, trimethylsiloxy-terminated dlmethylsiloxane-methylvinylsiloxane trimethylsiloxy-terminated copolymers, dimethylsiloxanemethylphenylsiloxane-methylvinylsiloxane copolymers, dimethylvinylsiloxy-terminated methyl(3,3,3trifluoropropyl) polysiloxanes, and dimethylvinylsiloxy-terminated dimethylsiloxane-methyl(3,3,3trifluoropropyl)siloxane copolymers.

Component (8) is an organopolysiloxume having at least 2 silicon-bonded hydrogen atoms in each molecule and is a crossilinet for component (A). Curing proceeds by the addition resident of the silicon-bonded hydrogen atoms in this component with the lower allowing times to propose (A) under catalysis by component (C). This component (8) must contain at least 2 silicon-bonded hydrogen atoms in exact molecule in order to function as a crossilineter. Furthermore, the sum of the number of allewing groups in each molecule in order to function as a crossilineter. Furthermore, the sum of the number of allewing groups in each molecule of component (B) and the number of silicon-bonded hydrogen atoms in each molecule of component (B) is to be at least S. Values below 5 should be avoided because a network structure is then especially not (gromed.

No specific restriction exists on the molecular structure of this component, and it may be any of straight othain, branch-ontaining straight chain, cyclic, etc. The molecular weight of this component is not specifically restricted, but it is preferred that the viscosity at 25 degrees Centigrate be 1 to 50,000 centifistories in order to obtain good missibility with component, (A). It is preferred that this component are the straight of silicon-bonded hydrogen atoms in the instant component and the total quantity of silicon-bonded hydrogen atoms in the instant component and the total quantity of all lower allewing groups in component (A) falls within the sir range of (1,5:1) to (20:1). It is difficult to obtain good curing properties when this molar ratio falls below 0.5:1. When (20:1) is exceeded, there is a lendency for the hardness to increase to high levels when the cured poduct is health. Furthermore, when an organositovane containing substantial allewing its applementarity added for the purpose of, for example, reinforcement, it is preferred that a supplemental addition of the Instant Silt-containing component to made in a quantity offsetting these alkenyl groups. This component is concretely exemptified by trimethylisticy-terminated ethyliphydrogenopolysionses, trimethylisticy-terminized dimethylisticane-methythydrogen-siloxane cyclic popularies.

Component (C) is a catalyst of the addition reaction of silicon-bonded hydrogen atoms and allernyl groups, and is concretely exemplified by chloroplatinic acid, possibly dissolved in an abothol or ketone and this solution optionally aged, chloroplatinic acid-olefin complexes, chloroplatinic acid-allernylsloxane complexes, chloroplatinic acid-dischore complexes, publicum black, and carrier-supported platinum.

This component is added preferably at 0.1 to 1,000 weight parts, and more preferably at 1 to 100 weight parts, a platinum-type metal proper per 1,000,000 weight parts and of the ball quantity of components (A) plus (B). Other organic groups which may be bonded to silicon in the organopolysilocane forming the basis for the above-described curable organopolysiloxine compositions are, for example, ally groups such as a methyl, ethyl, propyl, butyl, and octyl; substituted allyl groups such as 2-phenylethyl, 2-pheny

Examples of the production of the organopolysiloxane elastomer powder are as follows: an organopolysiloxane composition as described above (additional-curable, condensation-curable, or perioxide-curable) is mixed with water in the presence of a surfactant (nonlinic, anionic, cationic, catenic, or amphoteric), and, after mixing to homogeneity in a homomitier, colloid mill, homogenizer, propeller mixer, etc., this is cured by discharge into hot water (temperature at least 50 degrees Centigrade) and is then dried: the organopolysilozane composition (addition-curable), condensation-curable, or provided-curable) is cured by praying it frederly into a heated current; the powder is oblained by curing a radiation-curable organopolysilozane composition by spraying it under high-energy radiation; the organopolysilozane composition (addition-curable, or peroxide-curable) or high energy-curable organopolysilozane composition is curred, the latter by high-energy radiation, and the product is then pulverized using a known pulverizer such as, for example, a ball mill, atomizer, kneader, roll mill, etc., to thereby from the powder.

From the standpoint of producing a small, spherical powder having a uniform particle size, the prefered method is to mix the organopolysticane composition (addition-curable, condensation-curable, or premode-curable) with water in the presence of surfactant (norionic, arionic, cationic, or amphotoric) and then mix this to homogeneity using a homomiser, colloid mill, homogenizer, propeller mixer, etc., followed by curing by discharge into hot water (class 50 degrees Centigade) and then drying.

Average particle sizes for this component of all least 3 micrometers up to 3,000 micrometers are preferred in order to impart a cleansing action and smoothness to the facial cleanser of the present invention. Average particle sizes of at best 100 micrometers up to 1,000 micrometers are even more preferred. The removal of organic dirt and slicones will be unastistactory at average particle sizes below 3 micrometers, the facility and preferred the sizes of the preferred particle sizes below 3 micrometers.

This component's compounding ratio will vary with the cosmetic's formulation and so is not specifically or restricted. However, it is preferably 0.5 w/t% to 50 w/t% for solid and paste cosmetics and is preferably 0.1 w/t% to 30 w/t% for cream and emulsion cosmetics.

To prepare the facial cleanser of the present invention, organopolysiloxane elastomer powder as described above is blended and dispersed to homogeneity with the typical starting materials used for facial cleansers. These rew materials for facial cleansers are exemplified by surfactants, emollents, fatly acids, as alkali substances, alcohols, esters, humectants, thickeners, and purified water, and these may be used singly or as combinations of two or mores.

angly or as comissional or level on the season and the season and

The emollisms are exemplified by plant oils such as linseed oil, soybean oil, castro oil, and occount oil by planting oils such as sign you oil, mink oil, beet lablew, kern, and squalancy by minerul oils such as eye seen, paraffins, and microcrystalline waters; and by silicone oils such as dimethylopisiliosanes, methyl-phenylopisiliosanes, minerundicide polystiosanes, cyclic methyl-phenylopisiliosanes, cyclic methyl-phenylopisiliosa

The fatty acids are exemplified by myristic acid, launic acid, palmitic acid, stearic acid, behenic acid, lanolic acid, isostearic acid, undecylenic acid, hydrogenated animal fatty acids, hydrogenated plant fatty acids, and trilop-press fatty acids.

The alkali substances are exempfified by sodium hydroxide, potassium hydroxide, calcium hydroxide, diethanolamine, and triethanolamine.

useutanionation, and universactionate.

The alcohols are exemptified by lower alcohols such as ethanol, n-propanol, isopropanol, and butanol; and by higher alcohols such as lauryl alcohol, cetanol, stearyl alcohol, delyl alcohol, lanolin alcohol, hydropenated lanolin alcohol,

The esters are exemplified by fatty acid esters such as isopropyl myristate, butyl stearate, octyldodecyl neodecanoate, cholesteryl stearate, etc., and by the latty acid esters of polyhydric alcohols such as propylene glycul didecanoate, plycerd trig-decanoate, etc.

The humectants are exemplified by glycorol, propylene glycol, sorbitol, 1,3-butylene glycol, polyethylene glycol, urea, sodium lactate, sodium pyrrolidonecarboxylate, polypeptides, pyroalluronic acid, and acytemino acid.

The thickening agents are exemplified by natural polymens such as goar gum. carragenera, alginic acid, gum arabic, tragocanth, pecini, saterò, kantha gum, gelatin, casein, and albumin ty senin-igynthetic polymens such as starch derivatives, call gun derivatives, locust bean gum derivatives, collubos derivatives, and alginic acid derivatives; and by synthetic polymens such as polyminyl actohol, polyminyl proficione, polyminyl methacrytate, sodium polyacrytate, and polyethylene glycol. Furthermore, non-silicone powders may also be added to the facial cleanser of the present invention as long as the object of the present invention is not adversely affected. These non-silicone powders are exemplified by plant powders, such as the seeds and powders obtained from the apricot, almond, birch, wainut, peach, corn, sunflower, watermelone, etc., as well as througheasted locido oil and hydrogenated coccount oil; powders of almal origin to such as powdered crab shall, powdered oggshell, etc., as well as hydrogenated bard organic powders such as those obtained from polythylene, nylon, polypropylene, polypropylene, polypropylene, polypropylene, polypropylene, polypropylene, polypropylene, polypropylene, polypropylene, polymograpid polymo

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FYAMPLES

The present invention will be explained in the following with reference to illustrative examples. In the examples, the term parts refers to weight parts.

EXAMPLE 1

The following were mixed to homogeneity: 100 parts dimethylmylsiloxy-terminaled dimethylpolysiloxane having the following formula:

 $CH_2 = CH(CH_3)_2SiO (\{CH_3\}_2SiO)_{60} Si(CH_3)_2CH = CH_2.$

 4 parts trimethylsilxoy-terminated methylhydrogenpolysiloxane having the following formula: (CH₂)₂SiO (C{CH₃}HSiO)₂₅ Si(CH₃)₃

30. S parts polyoxyethylene (BEO) launy lether, and isopropantic chloroptatinic acid in a quantity stifficient to give 100 gpm plashum metal proper based on the total quantity of organopolysitionan. 100 Parts prided water was added and this was then passed through a colloid mill (colloid gap = 1 mm) and discharged into hot water (80 degrees Centificade) to produce an organopolysitionane elastioner growder. Using escanning electron microscopy, this organopolysitorane elastioner powder was found to be spherical and to have an 35 everage particle diameter of 250 micrometers. Furthermore, it was elastic.

A cleansing cream (cam) with the composition given in Table 1 was prepared using this organopolysitionane elastomer powder. This cleansing cream was prepared as follows. Glycenol. potassibility
hydroxids, and water were mixed in solvance at 70 degrees Centigrade, and this mixture was dripped into a
mixture (heated at 70 degrees Centigrade) of steam caid, painties caid, myrtetic caldi, callusic acid, object
acchol., lanotin-EO adduct and the organopolysitionane elastomer powder, followed by cooling to room
lemperature 25 degrees Centigrade) upon the completion of addition.

rempeature (co digress celling lately upon the compeant or accident of the compeant of polyethylene powder (average particle diameter = 150 micrometers) in place of the organopolysionare electioner powder or lackfind any powder.

Collagon membranes were prepared in advance by coating a 7 cm diameter circular area with 0.1 g loundation having the composition given in Table 2. In each case, 0.1 g cleansing cream was applied and nubbed uniformly over the loundation region for 30 seconds using a finger, followed by wiping with a waterseaked lowel for 10 seconds and then wiping with a dry formet.

In order to determined the cleansing effect of each cleansing cream, the brightness and angle of ontact for water were determined on the cleaned collegen membrane respectively using a CR100 cold. difference colorimeter from Minota Camera Kabushiki Kalaha and a contact-angle measurement device from Erma Opical Worls Limitade.

Sensory testing of the application of each cleansing foam was conducted using a ten-member panel. The various results are reported in Table 3.

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TABLE 1

component	Example 1 (parts)	Comparative Example 1 (parts)	Comparative Example 2 (parts
stearic acid	10.0	10.0	10.0
palmitic acid	10.0	10.0	10.0
myristic acid	10.0	10.0	10.0
lauric acid	6.0	6.0	6.0
oleyl alcohol	1.5	1.5	1.5
lanolin-EO adduct	1.0	1.0	1.0
organopolysiloxane elastomer powder	5.0	0.0	0.0
polyethylene powder	0.0	5.0	0.0
alvcerol	18.0	18.0	18.0
potassium hydroxide	3.5	3.5	3.5

TABLE 2

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FORMULATION OF FOUNDATION USED IN EVALUATION OF CLEANSING EFFECT

components

quaritly in parts
silicone-treated titanium oxide (AS\$1D from Toehiki Pigment Kabushiki Kaisha) dimethyloplysiloxare/200 cs
docamethyloplycontasiloxane
100 grees Centigrade)

TABLE 3

RESULT	S OF THE EV	ALUATIONS	
	Example 1	Comparative Example 1	Comparative Example 2
brightness contact angle	50.1 87	55.3 95	56.9 103
sensory testing (number of panelists)			
too greasy		-	5
smooth	4	-	5 .
foreign-material sensation	6	3	-
irritating		7	•

EXAMPLE 2

A liquid mixture was prepared from 100 parts hydroxyl-terminated dimethylpolysiloxane having the following formula:

100 parts trimethytsiloxy-terminated methythydrogenpolysiloxane having the following formula: (CH₃)₃SiO({CH₃}HSiO)₂₅Si(CH₃)₃,

1 part starnous octobals, i part polyoxyethylene (BEO) oleyl ether, and 1,000 parts ion-exchanged water. This was then emulstified in a colloid mill, heated at 50 degrees Cartigrade for 1 hour, and then spray-dried to produce an organopolysiloxene eleatomer powder. Using scanning electron microscopy, this organopolysiloxene plastomer powder was found to be spherical and to have an average particle diameter of 150 micrometers. Furthermore, it was eleation.

Too micrometers. Furnamentor, it was classiful.

A clearing cream with the composition given in Table 4 was prepared as follows using this organopolysiloxane elastomer powder. Hot water (70 degrees Centigrade) was dripped into a melh-mixture (70 degrees Centigrade) prepared from the solid paraffin, besewax, vaseline, liquid paraffin, scribtan sequiliassteama, POE (20E0) sorbitan monooleate, and organopolysiloxane elastomer powder.

Securious scaralus. For (2005) southern included to the company of this same formulation in which the corpanopolysioxane elastomer powder was replaced by an equal quantity of polyethylene powder (average particle clameter = 350 microniters), and the above formulation lacking any powder.

The cleansing effect determination and sensory testing were conducted on each cleansing cream as described in Example 1, and the results of these evaluations are reported in Table 5.

TABLE 4

component	Example 2 (parts)	Comparative Example 3 (parts)	Comparative Example 4 (parts
solid paraffin	10	10	10
beeswax	3	3	3
vaseline	15	15	15
liquid paraffin	41	41	41
sorbitan sesquiisostearate	4.2	4.2	4.2
POE (20EO) sorbitan monocleate	0.8	0.8	0.8
organopolysiloxane elastomer powder	5		
polyethylene powder		5	-
water	20.5	20.5	20.5

TABLE 5

RESULTS OF THE EVALUATIONS			
	Example 2	Comparative Example 3	Comparative Example 4
brightness contact angle	48.1 85	50.0 87	55.2 86°
sensory testing (number of panelists)			
too greasy		•	8
smooth	8		2
foreign-material sensation imitating	2	9-	

EXAMPLE 3

A cleansing lotion with the composition given in Table 6 was prepared using the organopolysiloxane elastomer powder prepared in Example 1.

The cleansing lotion was prepared by dripping ion-exchanged water with stirring into a liquid mixture of silicone surfactant (ICC442256 from Toray Silicone Company Limited), decamethylcyclopentasiloxane, the organopolysiloxane elastomer powder and POE (20EO) sorbitan monolaurate. After confirmation of a homogeneous mixture, mixing was continued in a homomixer to obtain the cleansing lotion.

Comparative Examples 5 and 6 consisted, respectively, of the same formulation as above in which the organopolysiloxane elastomer powder was replaced by the same quantity of polyethylene powder (average particle size = 20 micrometers), and the same formulation as above tacking any powder.

The cleansing effect determination and sensory testing were conducted as described in Example 1. The results of these evaluations are reported in Table 7.

TABLE 6

component	Example 3	Comparative Example 5	Comparative Example 6
	(parts)	(parts)	(parts)
DC3225C	9.5	9.5	9.5
decamethylcyclopentasiloxane	10	10	10
organopolysiloxane elastomer powder	1 3 1		-
polyethylene powder	1 - 1	3 .	
POE (20EO) sorbitan monolaurate	0.5	0.5	0.5
ion-exchanged water	74.5	74.5	74.5

TABLE 7

RESULT	S OF THE EV	ALUATIONS	
	Example 3	Comparative Example 5	Comparative Example 6
brightness contact angle	44.1 58	48.8 63	53.3 68
sensory testing (number of panelists)			
too greasy	· ·	6	
smooth	8	4	10
foreign material sensation	2	-	

The cleanser of the present invention, because it contains an organopolysitoxane elastomer powder, characteristically will not irritate the skin, is smooth in its application, and effectively removes organic dirt and silicones from the skin.

Claims

- 1. A facial cleanser having the characteristic that it contains organopolyslloxane elastomer powder.
- A facial cleanser described in Claim 1 wherein the average particle size of the organopolysiloxane elastomer powder is 3 micrometers to 3,000 micrometers.
- 3. A facial cleanser described in Claim 1 wherein the organopolysitoxane elastomer powder is spherical.
- 4. A facial cleanser described in Claim 1 wherein the content of organopolysiloxane elastomer powder pois 0.5 to 50 wt%.